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The sociology of education and digital technology: past, present and future

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Abstract: During the past fifteen years of his career, John Furlong's research and writing has focused – in part - on digital technologies and people's everyday experiences of education. While hardly a technology expert, John's work has shown an acute awareness of the significance of computers, the internet and mobile telephony in making sociological sense of education. This paper contrasts the limited visibility of such issues within the sociology of education over the *past* thirty years with how the *present* situation appears to be improving during the 2010s. The paper also identifies opportunities for *future* work that engages more in the co-production, development and design of new forms of educational technology. As such it is concluded that a future sociology of education and technology needs to be developed that acts not only *against*, but also *in* and *beyond*, the dominant field of education technology.

Keywords: digital technology, internet, computers, education

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1. INTRODUCTION

Digital technology is part of contemporary education in ways that would have been hard to imagine even a few years ago. Digital technology is now woven so tightly into the fabric of everyday life that there can be few areas of education that go untouched by 'the digital' in one form or another.[1] Digital devices such as tablets, laptops and smartphones now support a diversity of informal learning practices at home, at work and on the move. Classrooms and other formal learning environments are awash with computer hardware and software, and a growing amount of educational work is conducted on a 'virtual' basis. In particular, the day-to-day running of schools and universities is underpinned by software systems that support and structure individual action in a variety of ways. Despite the diversity and complexity of technologies in use, 'the digital' is now an expected but largely unremarkable feature of the educational landscape.

In this paper we contend that the increasing normalisation of digital technology requires a sustained and substantial response from across all facets of the sociology of education. Indeed, digital technologies are such an integral component of everyday education that 'the digital' should not just be limited to those researchers who have a particular interest in technology, media and 'ICT'. Instead digital technology should be a broad concern for *all* education researchers, regardless of specialisation or background. In addition, it could be argued that there are growing opportunities for sociologists of education to explore ways of engaging in the active construction of educational practices and institutions that reflect, challenge and build upon the wider socio-technical changes of today. Such engagement, we feel, would certainly chime with the interest that John Furlong showed during the latter half of his research career in digital education. That more 'mainstream' sociologists of education of John's generation have not shown a similar interest is a shame. That sociologists of all generations now start to pay more attention is critical to the continued health of the field.

John Furlong's approach to education and digital technology

We both owe a great deal to John Furlong. As Head of Department, John was responsible at the end of the 1990s for appointing both of us to junior posts at the University of Bristol. He also had a hand in suggesting that we shared an office – an act of social engineering that has resulted in us writing together intermittently for the past fifteen years or so. More significantly, we each worked in turn with John on large-scale projects funded by the ESRC between 1998 and 2005 which examined various aspects of digital technology and education. One of us (Keri) worked with John on the 'ScreenPlay' project – a two year study that explored how computer technologies were being used in the home, within families, at school and amongst

peer groups of young people. The other (Neil) then worked with John on the subsequent 'Adults Learning @ Home' project – the first large-scale attempt to investigate the influence of information and communications technologies on how adults were learning throughout the life course.

John's imagination and insight set the results of these research projects above most other analyses of education and digital technology of the time. While assuming a 'detached' professorial engagement with the day-to-day 'grind' of project work, John's contribution to the planning, data collection and analysis stages were crucial. For example, during the Screenplay project, John's sensitive observations of the continuities between digital gaming and traditional childhood play, between the new patterns of digital exclusion and longstanding inequalities, ensured that this project did not fall into the traps of excessive optimism *or* excessive alarm that characterised many late 1990s' studies of children and technology. He was concerned, always, for a more precise analysis that located technological change in its lived, historic and sociological contexts. Similarly, John took main responsibility as the architect of the Adult Learning@Home proposal - drafting a succession of insightful and sharp research questions that set the project on a very successful course. The data that then arose from the handful of case studies that John conducted himself was by far the richest and most insightful. John developed a genuine empathy with the people that he interviewed, thereby drawing out the social meanings of technology in their lives. The data that John collected, and the insights that he brought to that data, certainly had a disproportionate influence on the writing-up of both projects (see Facer *et al*. 2003, Selwyn *et al*. 2006).

Looking back, we would contend that John provides a good example of how the sociology of education can engage with new technologies. During the 1990s he was quick to see that computers and the internet were becoming essential aspects of contemporary life, and therefore essential aspects of being able to lay claim to understanding education and society. While he was undoubtedly fascinated by some of more spectacular digital practices that our research uncovered, he remained appropriately distanced from the technology itself. John was (and still is) certainly not an academic who is tethered to their iPad, smartphone or laptop. During the course of his investigations, therefore, John was able to appreciate that the privileged position that many academics enjoy with regards to their access to the latest technologies does not extend to the majority of the general population. Thus beyond the technology itself, John's interest in 'the digital' was framed by his over-riding concern as a sociologist for people and social relations, inequalities and social change. This, we suggest, is an approach towards digital technology that should be replicated across the discipline.

2. THE PAST NON-APPEARANCE OF A 'SOCIOLOGY OF EDUCATION AND TECHNOLOGY'

Our central contention in making these observations about John's work during the 1990s and 2000s is that there has long been a need for a serious, sustained and committed 'sociology of education and technology'. We are by no means the first people to make this observation. As Michael Young argued thirty years before:

> "… conceptualising technology, not just information technology, is increasingly necessary if sociologists of education are to make the critical contribution to issues of educational policy and practice that has been part of our tradition since the early work on educability of Floud, Halsey and Glass in the 1950s" (p.206).
>
> "… good sociological research will not produce anti-technology arguments, but will highlight ways in which we may be able to explore the social character of the technology. In doing so it could help us to raise fundamental questions about our work as teachers" (p.209).

Despite its prescience, Young's call-to-arms remained largely unheeded throughout the 1980s, 1990s and 2000s within mainstream sociology of education. While a succession of substantial technological changes occurred during this time (e.g. the mainstream emergence of 'standalone' computing, the internet and mobile telephony), the sociology of education proved slow in paying attention. Aside from a handful of disparate individuals at the margins of the field, digital technology could not be said to feature prominently in the recent history of the sociology of education.

Indeed, when looking back for signs of a 'sociology of education and technology' during the past three decades, one can point only a disjointed corpus of work. In North America, for example, a modest lineage can be traced through the work of Stephen Kerr, Steven Hodas and David Noble in the 1980s to Hank Bromley, Gary Natriello and Torin Monahan in the 1990s and 2000s. On occasion, technology also captured the fleeting attention of a few 'big names' within the sociology and philosophy of education such as Michael Apple, Michael Peters, Douglas Kellner, Andrew Feenberg, Jane Kenway and Roger Dale. Otherwise, the most impressive sociological critiques of education and technology during this time originated from authors working *outside* of the sociology of education. These included historians such as Larry Cuban and Neil Postman, as well as scholars working within 'Media Education' and 'New Literacies' traditions such as David Buckingham, Bill Green, Colin Lankshear, Mark Warschauer and others.

Up until the mid 1990s, at least, the sociology of education could be perhaps excused for failing to engage with technology as a subject of critical scrutiny – if only because this was a common blind-spot within most areas of sociology. Indeed, Michael Young was careful to acknowledge that his 1984 critique could have been directed towards any area of sociology at the time. However, during the 1990s and 2000s other areas of sociological study began to engage with the topic of digital technology in ways that the sociology of education simply did not. For example, during the 1990s the 'Sociology of Technology' and 'Science and Technology Studies' began to focus on the epistemological and ethical debates promoted by use of computerised technologies and the 'virtual society'. Similarly, sub-fields such as the sociologies of work and employment, health and illness, media and communications all embarked on vigourous dialogues about the digitizaton of their respective areas. Subsequently, during the 2000s, hybrid fields of 'internet research', 'new media studies' and 'digital sociology' also began to emerge, supported by the establishment of organisations such as the 'Association of Internet Research' and journals such as 'New Media & Society' and 'Information, Communications & Society'. Yet while scholars working in these areas might have occasionally turned their attention towards the complexities of

digital education, this interest was rarely reciprocated by education specialists. Even at the end of the 2000s, it was difficult to make a claim for there being a deliberate 'sociology of education and technology'.

On the one hand, the reluctance of the sociology of education to get involved with digital technology – even during the height of the 'web 2.0' boom of the mid 2000s - was wholly understandable. Looking back to the new media landscapes of the 1980s, topics such as MUDs, MOOs and virtual reality were (at least to the untrained eye) essentially peripheral social phenomena. Similarly, in the 2000s the emergence of Facebook, Twitter and Second Life might have also appeared too ephemeral and shallow in nature to warrant serious sociological consideration. As such, the tendancy for 'serious' sociologists of education to shy away from digital technology was undoubtedly underpinned by justifiable suspicions of faddishness. It is certainly understandable, therefore, that sociological researchers and writers might have perceived 'the digital' as too slippery a target to merit the attention that one would afford to more straightforward educational 'issues' during the 1990s and 2000s. This was a period, after all, when sociologists were confronted with an onslaught of neo-liberal reforms of education, coupled with ever-growing inequalities of opportunity and outcome. Thus the overlooking of digital technology during the 1980s to 2000s was understandable, if not unfortunate.

Until very recently, then, the reticence of the sociology of education to address the digital placed the field at a notable disadvantage. Not only was the sociology of education beginning to be left behind by other subfields of sociology, but the topic of 'educational technology' grew to be a major area of educational study in its own right with little or no sociological input at all. Crucially, this lack of sustained sociological interest saw the academic analysis of technology in education become dominated by psychological attempts to understand the relative merits of different uses of technology for learning. Thus the majority of academic work in the area of education and technology continues to be framed within the 'learning sciences' rather than the social sciences, with its thoughts influenced firmly by post-Vygotskian theories of learning. Where this has been contested, dissent has emerged not from sociology of education, but from hybrid fields such as media and cultural studies. These critiques, however, have often focused on the potential for digital empowerment in emerging youth cultures and have led to more limited engagement with the confines of formal education. Thus, despite longstanding acknowledgement of the need for theoretical expansion and sophistication (e.g. Hlynka and Belland 1991), research into education and technology as a whole has too often been characterised either by technocratic discourses of 'effectiveness' and 'best practice', *or* a search for emancipatory youth cultures that draw scholarly attention away from the lived experiences and constraints of formal educational settings.

3. THE PRESENT EMERGENCE OF A 'SOCIOLOGY OF EDUCATION AND TECHNOLOGY'

So what now of the 'present' state of a sociology of education and technology? As the 2010s progress, there *are* perhaps encouraging signs of a nascent tradition of work. Analyses of digital education are beginning to now feature more frequently within the pages of specialist journals such as the *British Journal of the Sociology of Education*

and *Sociology of Education*. Conversely, 'new media' scholarship (as evinced in journals such as *Information Communication & Society* and *New Media & Society*) is increasingly turning its attention towards educational topics and issues. It is no longer a novelty to see doctoral studies being purused (and doctorates awarded) in sociological aspects of education and technology, with taught programmes in subjects such as 'Education, Technology & Society' also thriving at undergraduate and postgraduate levels. In addition, mainstream educational technology journals are beginning to feature work that draws directly from the likes of Foucault (Hope 2013), Bourdieu (Johnson 2009), Bernstein (Player-Koro 2013), Goffman (Davies 2012), actor network theory (Wright and Parchoma 2011) and even marxian perspectives (Hall 2011).

If these trends continue, then we could well be on the cusp of seeing the sociology of education take the decisive 'digital turn' that Michael Young was calling for thirty years before. Viewed in this manner, then, there are a number of key issues and debates relating to 'the digital' that should continue to develop within the mainstream sociology of education. These then, are some of the areas of significant attention within an emerging 'sociology of education and technology':

i) Digital technology and the reconfiguration of space, time and responsibility

One of the most significant 'digital' issues to have recently captured the attention of sociologists of education is the temporal and spatial expansion of educational processes and practices through technological means. Indeed, the negation of boundaries lies at the heart of the ideological promises of digital education. Sociologists have therefore moved on from initial concerns over 'time-space compression' and a 'death of distance' to explore the implications of these changes. In particular, the provision of digital education on an expanded and accelerated 'any time, any place, any pace' basis raises a host of questions relating to educational engagement and educational governance – not least the redistribution of responsibilities across different sites and actors (Webster 2013). Indeed, digital technology is clearly associated with a redistribution of work that has to be done in delivering educational opportunities, as well as a potential redistribution of responsibility for educational outcomes that result.

These issues are beginning to feature in sociological research. For example, as the rich ethnographic work by Melissa Gregg (2011) has shown, the increased use of highly portable, personalised digital devices coupled with broadband internet connectivity has led to an 'always-on' state of potential engagement with education and training for many adults, and an expansion of educational work into unfamiliar areas of society and social life. With digital technology supporting the expansion of education and learning into domestic, community and work settings, parallels can be drawn with Basil Bernstein's (2001) notion of the 'total pedagogization of society' – i.e. a modern society that ensures that pedagogy is integrated into all possible spheres of life. Indeed, the digital pedagogization of previously non-pedagogized areas of social life is apparent in digital technologies such as virtual learning environments, mobile games and even the recent trend of attaching 'badges' to everyday online activities and practices to signify their educational 'value'. In all these cases, digital

technologies are seen to be enabling educational engagement regardless of place, space or setting.

However, while these forms of 'always-on' access to education are usually presented as extending individual choice, concerns are being raised by some researchers that these technologies might simply exacerbate forms of individual exploitation. For example, the erosion of previously clear distinctions between formal and informal learning has prompted concerns over the exploitation of individuals who feel increasingly compelled to engage with education regardless of appropriateness or potential detriment to other areas of life. Digital technologies can be seen to support this compulsion in a number of different ways (Bulfin and Koutsogiannis 2012). For instance, school students may find the family becoming reframed as a site of increased engagement of schoolwork while outside of school (see Selwyn *et al*. 2011) – further increasing what Beck-Gernshiem (1998) describes as the 'pressure' placed upon the contemporary family to educate. Similarly, adults and children alike may find digital technologies further eliding the social relations of learning and consumption, thus reducing the available time for what Andre Gorz (2001) refers to as 'time for living'.

ii) Digital technology and the (hyper) individualisation of education

These latter points feed into broader concerns beginning to be raised by sociological studies over the 'individualisation' of educational engagement demanded by digital technology. Most forms of digital education now demand increased levels of self-dependence and entrepreneurial thinking on the part of an individual, with educational success dependent primarily on the individual's ability to self-direct their on-going engagement with learning through various preferred means - what has been termed 'networked individualism' (Wellman *et al*. 2003). Of course, this is usually assumed to work in favour of the individual, yet the idea of the self-responsibilized, self-determining learner places an obvious emphasis on the capabilities of individuals to act in an agentic, empowered fashion. As such a number of studies have begun to unpick the uneasy and often unconvincing assumption of the individual 'rational' learner operating within an efficient technological network. At best, then, studies suggest that only privileged groups of learners are able to act in this empowered fashion. For example, Selwyn's (2011) study of globally distributed cohorts of distance learners found the processes of online study to be constrained substantially for many women by the temporal constraints of child-raising and household work commitments. Similarly, Erichsen and colleagues' (2013) study of online doctoral education highlighted issues of cultural and racial (mis)understandings between students and staff as impeding the fully beneficial 'participation' of many students. As such the individualization of action associated with these digital forms of education could be seen as increasing the risks as well as opportunities of educational engagement. As such, this work reminds us that the positioning of technology-supported individualization as a biographical solution to systemic contradictions is not without its potential problems (see Popkewitz 2006).

iii) Digital technology and educational inequalities

All of the issues highlighted so far reflect the importance of considering the various unequal power relations and hierarchies that are entwined with the use of technology in education. As such, a major sociological concern is the continuing inequalities and injustices associated with the use of technology in education. Indeed, there is a growing body of evidence suggesting that educational uses of digital technology are differentiated along a number of lines. These digital inequalities are especially pronounced in terms of socio-economic status, social class, race, gender, geography, age and educational background - divisions that hold as true for younger generations of learners as they do for older generations (Helsper and Eynon 2009, White and Selwyn 2012), as well as those in rural areas (Mardis 2013). While no longer a prevalent term within popular and political discourse, the spectre of the 'digital divide' in terms of access to technologies still looms large over any discussion of the potential benefits of digital technology in education.

Aside from inequalities of access, there is also growing evidence that digital technology use in education is not the equitable and democratic activity that it is often portrayed to be. Even when able to access technology, the *types* of digital tools that an individual uses, the *ways* in which they are used, and the *outcomes* that result are all compromised by sets of 'second order' digital divides (echoing the distinction between engaging meaningfully as opposed merely to 'functioning' with technology). There is considerable evidence that these 'second order' inequalities persist along familiar lines. For example, a survey of over 6400 Australian high school schools portrayed a highly divided picture of students from higher-status independent and faith-based selective schools being more inclined than state school students to be making better 'academic' use of the internet - therefore leaving academic use of digital technologies "a function of broader processes of social reproduction" (Smith *et al.* 2013, p.115). In terms of race and ethnicity, various recent studies of black South African university students (Czerniewicz and Brown 2013) and Latina/o college students in Central Texas (Lu and Straubhaar 2014) have described ethnically-distinct subgroups as occupying a different technological habitus from those generally valued within higher education. Similarly, Sarah Lewthwaite's (2011) study of technology experiences of disabled university students found social media to not necessarily overcome issues of offline disabilities, but instead often exacerbate the boundaries of disability. Sociological studies such as these suggest that it is idealistic and unhelpful to imagine digital technology as providing necessarily democratised or de-segregated educational experiences.

iv) Digital technology and educational contexts

These issues of inequality and disadvantage relate to the context(s) of use within which digital technologies are adopted (or not) and deployed (or not) within educational settings. There is a growing body of work that addresses the ways in which digital technologies are actually adopted, redefined and given different meanings within the context of the school, university or other 'local' educational setting. In particular, this work highlights how digital technologies in education are subject to multiple stabilisations at the local level. This is not to say that changes do not occur, rather that "innovation is performed, produced and stabilised over time but in ways that depend on its compatibility with the values and cultural norms of its context of use" (Webster 2013, pp.231-232).

A number of recent studies have examined how various educational technologies are shaped by context – not least how digital systems are normalised and routinized in local settings. For example John Hannon's (2013) study of the integration of 'learning content management systems' into university contexts shows how technology use in higher education is compromised and reconfigured by numerous pre-existing social, material and discursive 'accommodations' between technology work and academic work. Ola Erstad's (2013) research into learning in homes and cities also makes visible the way in which family cultures, patterns of migration and national identity all play a role in framing relationships with digital technologies. Similarly, David Johnson's (2013) investigation of the meanings that university professors attach to the use of digital technologies for their teaching contrasts the compulsion from university authorities for the increased use of digital teaching tools against staff perceptions of academic freedom, professional autonomy, pedagogic beliefs and the primacy of research, writing and personal scholarship over other aspects of work. The key point from this particular study is that while some senior academics have the occupational status and power to circumvent such pressures, others do not and are coerced into using technologies that subtly 'unbundle' and deskill their work.

A range of recent studies have also examined the (non)use of digital technologies within schools. This research has highlighted the systemic nature of educational activity, and worked to develop understandings of the dynamics of how new tools become embedded in the broader 'ecology' of local practice. As such, a complex picture has emerged that highlights a number of existing influences at the level of the individual teacher, the layered school 'context' of the classroom, school, local community, state and nation, as well as the presence of many different competing innovations at any one time. David Shutkin's (2013) ethnographic study of the implementation of one-to-one laptop programs in US schools, ably illustrates the tensions at play between incoming technologies and the history and practices of everyday school life. This research showed how official efforts to provide 'one-to-one' access to laptop computers clashed with student perceptions of what constitutes 'meaningful' school work, parental hopes for the future, institutional concerns over 'risk' *and* perceived economic demands for 'twenty-first century skills'. Shutkin's work – and other like it – therefore highlights the importance of acknowledging the differing and often divergent 'interpretation, translation and narration' of discourses of change and innovation that tend to be associated with digital technologies in education.

4. THE FUTURE IMPERATIVES FOR AN ENGAGED 'SOCIOLOGY OF EDUCATION AND TECHNOLOGY'

While more work needs to be done before digital technology can be classed as a *bona fide* concern of the sociology of education, these examples suggest that a sustained body of recent research can now be identified and built upon. The research and writing highlighted above is certainly beginning to expose a number of the 'truths' that Michael Young was pointing towards 30 years ago. In 2014, we can therefore say with some confidence that sociological research *is* now ably showing that digital technologies in education are not neutral but political; that they are carriers for assumptions and ideas about the future of society; that their design, promotion and use

are all sites in which struggles over power are conducted. Academic work *is* now being carried out that focuses explicitly on the fact that digital technologies are implicated deeply within unequal relations of power elsewhere in education and society. The use of digital technology in education is therefore being rightly framed against long-standing and entrenched terms of struggle over the distribution of power. In short, the sociology of education could now be said to be fast catching-up with sociology in general – developing a capacity to "reflect on the increasing normality and inclusion of the digital in everyday life, resisting binary tendencies and highlighting the mess *and* the continuities in new digital social landscapes" (Prior and Orton-Johnson 2013, p.2).

From this perspective, therefore, the immediate future for a sociology of education and digital technology looks to be in a stronger position than it ever has been before. Yet, as we look towards the continued development of a sociology of education and digital technology there is perhaps room for further engagement with technological change.

In so doing, this brings us back to John Furlong – not least his recent writing on 'Education' as an academic discipline (Furlong 2013). In this spirit an additional tenet of the sociology of education and digital technology, we propose, should also be an increased focus on more engaged and participatory research practice in which the insights of sociology are effectively mobilised to harness, contest and inform emerging educational practices with technology. Thus alongside work that documents the patterns of power and inequality implications in the use of digital technologies in education could be increased efforts to also systematically construct *alternative* trajectories. This implies, in Burawoy's (2005, p.324) terms, a shift toward an avowedly *public* sociology of education and digital technology, committed to the defence of the social and of humanity, which moves "from interpretation to engagement, from theory to practice, from the academy to its publics". We shall therefore conclude this paper by considering briefly what forms these new directions might usefully take.

An important part of this process of beginning not only to critique but also to build alternatives would necessarily consist of building alliances with those who bring distinctive expertise and knowledge to bear in creating these alternatives. This implies an increased interest in developing a 'live sociology' of digital technology and education – i.e. sociological work that is inventive, creative and makes a practical contribution. As Lupton (2015) reasons, this involves a commitment to on-going and extensive dialogue with learners, educators, developers and civil society groups in order to identify and to experiment with how things might be 'otherwise'. These sentiments are certainly in tune with John Furlong's (2013) own call for educational research that is situated, collaborative and organised around productive dialogue between theory and practice, between critique and action. The notion of developing a future sociology of education and technology that might build such 'really useful knowledge' (Lauder *et al*. 2009) and make a difference to the nature of education in an era of rapid socio-technical change is therefore worth considering. Of course, adequately addressing how this might be achieved will take a lot longer than the remaining space available to us in this paper. At its heart, though, we would propose that an engaged sociology of education and technology could take advantage of its understanding of the inherently political and social processes of technology

production and use, in order to also create opportunities for the production of alternative educational futures. We would suggest that this might take two distinct but fundamentally inter-related dimensions.

First, sociological perspectives are a ready 'way in' to opening up spaces of possibility for new equitable and potentially 'disruptive' forms of educational technology to be imagined and to flourish. Understanding the appropriation of technologies in education as informed by context, as a process of contestation, practice and resistance and as a site through which power relations are enacted, opens up room for sociological analyses that surface the tensions that exist between the homogenising discourses and the messy reality of digital technologies in education. Analyses can be oriented toward understanding where there are opportunities for creating difference from homogeneity, unity from fragmentation and division, and equality from hierarchy (Lefebvre 1981). Sociological analyses are distinctively well placed to uncover and understand where reversals and unintended consequences are emerging, where unexpected alliances and conjunctures might be forming, and where discontinuities might be in evidence. In this process, it is therefore sociological concerns with the deep-rooted continuities of education in a 'digital age', are complemented by efforts to also understand where educational practices and processes are being reconfigured by new technological practices along more equitable and empowering lines.

Second, sociologists are also in a good position to intervene in the process of technological design and development. In particular, the emerging area of critical participatory design might offer a ready set of methods where design processes might be challenged and reoriented towards the interests of students and communities. This work focuses on involving usually excluded 'end users' in the development and production of technological artefacts and practices in ways that better reflect their interests, needs and values (Iversen *et al*. 2012, Eubanks 2011). As Bossen *et al*. (2012, p.32) describe:

> "From the outset, a core characteristic of participatory design has not only been to design better products and systems through user involvement, but also to improve user circumstances with respect to their working conditions, and ability to participate and have a voice in decision-making ... More broadly, this latter strand of participatory design aims to contribute to the improvement of the quality of life and democratic participation, by involving people in the design and implementation of new technology".

This perspective therefore calls for participatory research that is explicitly based around values of democracy, dialogue, reducing power relations, enhancing quality of life and encouraging emancipation. As Iverson and Smith (2012 p.106) reason, the 'end goal' of such work would be less the final prototypes and product designs, but using research to provide students, teachers and other non-technology experts with a sense that "when it comes to the design of future technology, they actually have a choice".

One example of a more engaged research stance that exemplifies some of these traits was the 'Glitch Game Testers: African American Men Breaking Open the Console' project (DiSalvo *et al*. 2009). This project involved both a critical inquiry into

contemporary patterns of engagement with digital technology and an engaged, technologically literate strategy to transform what had been patterns of exclusion into powerful resources for change. Specifically, the study was triggered by a concern that young African American men, despite being the heaviest users of games technology were relatively under-represented in Computer Science courses in school and university. The study began with detailed empirical qualitative research to understand youth digital cultures and, in a nuanced analysis, the study describes how these young men's rich cultures of performance and sportsmanship in computer gaming militated against the habits of hacking and modification that often encourage an interest in computer science. The researchers then developed an educational intervention to build their agency in the digital domain that would specifically 'respect their culture of play and honour their culture of sportsmanship' (DiSalvo *et al*. 2009, p.2). This was achieved by creating a program of activities that were based around peer-led, competitive, games testing. 'Hacking' was reframed as a positive form of 'testing' games, harnessing the young men's sense of fairness and justice in sportsmanship while at the same time opening up their awareness of the digital as a designed and imperfect space. Interestingly, the team included both computer scientists and scholars trained in philosophy and languages, but *not* a single researcher who identified themselves as a sociologist of education.

The reason we introduce this particular project here is because it seems, to us, to encapsulate some of the elements of a powerful future sociology of education and digital technology. This would be academic work that is appropriately critical but also alert to existing social, cultural and economic inequalities and the potential for these to be exacerbated via digital cultures. This would be academic work that is informed by robust empirical analysis that seeks to understand, to witness and to open up the spaces for possibility. The ultimate aims of such refocusing would be to turn critique and insight into the production of alternative strategies. One limitation of such design processes is that such designs can be constrained by the experiences of participants and by their perceptions of possibility within the existing situation. It is here that the sociologist of education and digital technology, therefore, may place an important role by enabling participatory design practices to understand how and where to best position itself in the wider relations of power that structure conditions of possibility within education. The sociologist of education and digital technology, in this role, is neither designer, nor user, but critical friend and collaborator. Had the 'Glitch Game Testers' research team also included a sociologist of education, what wider changes – perhaps structural - might it have explored and engendered?

5. CONCLUSIONS

In this paper we have argued that there are finally signs that digital technology is beginning to become a serious topic of interest within the sociology of education. Yet we have noted the accompanying need for 'the digital' to begin to a matter for action as well as analysis. As such, there is clearly much work that we can be getting on with, and the issues raised in the latter sections of this paper raise important challenges for academic sociologists. Not least, they suggest that sociologists of education seeking to provide a critical analysis of contemporary education would benefit from developing at least a passing familiarity with the design and development processes of emerging digital technology and its possibilities. If the sociology of

education is to play a role in shaping these debates rather than commenting from the side-lines, then more academic sociologists should be encouraged to not only continue to pursue the familiar positions of critique and analysis, but also to develop an interest in assuming the roles of being co-producers, developers and designers of educational technologies. In other words, a sociology of education and technology needs to be developed that acts not only *against* but also *in* and *beyond* the dominant field of education technology.

To bring our thoughts back to the work of John Furlong, much of what has been argued for here relates to broader questions over the nature of the 'disciplines' of education. As John spelt out in his recent writing on this topic (Furlong 2013, Furlong and Lawn 2011), 'Education' not only has to justify itself as an intellectually coherent field of study, but it also has to justify itself within the wider politics of education development and change. In both these respects, greater prominence within educational sociology for understanding the implications of 'the digital' can only strengthen the relevance of education as a discipline; both in respect of the contributions it might make to the wider interests of contemporary academic life and to the emerging concerns of contemporary society.

ENDNOTE

[1] We are well aware that observations of these kind can only be made from the privileged position of (over)developed countries such as the UK and Australia. At a rudimentary level, it is important to remember that around half the world's population has no direct experience of using 'the internet' at all. While is this likely to change with the global expansion of mobile telephony, the issue of unequal access to the most enabling and empowering forms of internet use remains a major concern.

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